

**Table 1. Rational for selected metabolism rate coefficients**

Dioxin/Furan Congener	Species	Distribution Range	Selected Value	Rationale
<b>Developed as part of the 2009 FWM report:</b>				
2,3,4,7,8-PentaCDF	all fish	0 to 0.3	0.024	One $K_M$ value was available in the database (equal to 0.02 for guppy) (Arnot et al 2008); distribution range based on 0 to 10 times the database value.
	invertebrates	0 to 0.3	0.024	No invertebrate specific rates were available; thus, the same distribution as developed for fish was applied to invertebrates.
<b>Developed as part of 2014 dioxin/furan congener exercise</b>				
1,2,3,4,7,8-HexaCDF	all fish	0 to 0.7	0.02	No chemical-specific $K_M$ values in database (Arnot et al 2008); values for other Hexa CDD/CDFs ranged from 0.03 to 0.07, so distribution range based on 0 to 10 times the highest value for a Hexa CDD/CDF.
1,2,3,6,7,8-HexaCDD	all fish	0 to 0.4	0.08	One $K_M$ value in database (equal to 0.04) (Arnot et al 2008); distribution range based on 0 to 10 times the database value.
1,2,3,7,8-PentaCDD	all fish	0 to 0.2	0.01	One $K_M$ value in database (equal to 0.02) (Arnot et al 2008); distribution range based on 0 to 10 times the database value.
2,3,7,8-TetraCDF	all fish	0.04 to 0.2	0.1	Two $K_M$ values in database (equal to 0.04 and 0.2) (Arnot et al 2008); distribution range equal to range of these literature values.
2,3,7,8-TetraCDD	carp only	0.0016 to 0.056	0.0016	Three carp-specific $K_M$ values in database (equal to 0.008, 0.014, and 0.019) (Arnot et al 2008); distribution range equal to estimated 2.5 to 97.5 percentiles using these literature studies.
	other fish	0.007 to 0.024	0.007	Four $K_M$ values in database (equal to 0.007, 0.008, 0.009, and 0.024) (Arnot et al 2008); distribution range equal to range of these literature values.

Notes: No invertebrate metabolic rates were used for model optimization as part of the 2014 dioxin/furan congener evaluation. A literature review done after this time indicates that invertebrates are able to metabolize at least some dioxins/furans, and thus further research is recommended in this area to allow for the development of invertebrate metabolic rates for the various dioxin/furan congeners.

Reference: Arnot JA, Mackay D, Parkerton TF, Bonnell M. 2008. A database of fish biotransformation rates for organic chemicals. Environ Toxicol Chem 27(11):2263-2270.

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This document is currently under review by EPA and its federal, state and tribal partners, and is subject to change in whole or in part.